## THE LIGHT FROM THE SKY—II.[1]

The light received from any given area of the night sky is made up of (1) starlight, (2) scattered starlight, and (3) earthlight, the last including all light not due to the stars. Above 40° galactic latitude the starlight is a relatively small percentage of the whole, and can be computed from star counts; the *total* light received from any area may be photometrically measured.[2] It is found that the illumination not due to starlight is *not* uniformly distributed over the sky. The investigations of Van Rhijn [3] show a kind of zodiacal light extending over the whole sky, the intensity depending upon the celestial latitude and longitude. By finding the excess of this zodiacal brightness over its mean value for each latitude and longitude, and applying a correction equal to this excess but of opposite sign, to all the measurements, the latter are made independent of the azimuth; the difference between total observed illumination and corrected earthlight gives the starlight, even for galactic regions. The earthlight corrected for the zodiacal illumination consists of direct earthlight and scattered earthlight; applying a correction for the latter (Abbot, Astron. Jour., 1914, **28:** 130), the earthlight is found to increase toward the horizon, indicating illumination due to a permanent aurora. The total amount of light received from all the stars in both hemispheres, as computed from present material, is equal to 1,440 stars of magnitude 1.00 Harvard visual scale; Chapman (Monthly Notices, 1914, **74:** 450), has obtained, by very different methods, 900–1,000 for this figure.

Rayleigh has found the night sky to be yellower than the day sky (*Cf.* MONTHLY WEATHER REVIEW, 1920, **48:** 468), again indicating that the night illumination is not due to scattering by an elevated attenuated atmosphere.

A summary of all determinations of the brightness of the night sky is given by Burns,[4] as follows:

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| 1. Newcomb, *Astrophys. Jour.*, 1901, **14:** 279 | 0.029 |
| 2. Burns., *ibid.*, 1902, **16:** 166 | 0.050 |
| 3. Townley, *Pub. Ast. Soc. Pac.*, 1903, **15:** 13 | 0.050 |
| 4. Fabry, *C. R.*, 1910, **150:** 272 | 0.036 |
| 5. Yntema, *Gron. Pub.*, 22 | 0.140 |
| 6. Abbot, *Astron. Jour.*, 1911, **27:** 20 | 0.075 |
| 7. Van Rhijn, *Astrophys. Jour.*, 1919, **50:** 347 | 0.130 |
| 8. Burns, *Jour. Brit. Ast. Assoc.*, 1914, **24:** 463 | 0.030 |

Evidently some source of error has not yet been eliminated. (1) Did not claim to be precise; (2) was in an unfavorable locality; (3), (4) were by photographic methods (out-of-focus star methods) and could not be expected to agree with the visual methods; (5), (6), (7), used Yntema's method, and (8) used a special photometer. Burns concludes, however, that different peculiarities among the eyes of different observers, and differing atmospheric conditions (even though imperceptible to ordinary observation), etc., would preclude the expectation of close agreement.

The results of observations on the scattering of light by dust-free pure gases [5] have led to attempts at a mathematical explanation [6] in terms of atomic and molecular structure.—*Edgar W. Woolard.*

[1] *Cf.* MONTHLY WEATHER REVIEW, June, 1920, **48:** 353–354.
[2] Yntema's method is to determine the absolute amount of light received per square degree at the pole by comparing the brightness of the sky there with that of an artificially illuminated disk of opal glass and then estimating the stellar magnitude of the disk by observing it from a distance such that it has the appearance of a star; the light of other regions of the sky may then be compared with that of the polar area by varying the illumination of an annular screen in a measurable way until it disappears against the background of the sky.
[3] P. J. Van Rhijn: On the brightness of the sky at night and the total amount of starlight. Astrophys. Jour., 1919, **50:** 356–375.
[4] G. J. Burns: Brightness of the night sky. Astrophys. Jour., 1920, **52:** 123–126.
[5] Lord Rayleigh: A reexamination of the light scattered by gases in respect of polarisation, Proc. Roy. Soc., 1920, A, **79:** 435–450; **98:** 57–64.
[6] J. J. Thomson: On the scattering of light by unsymmetrical atoms and molecules Phil. Mag., 1920, (6), **40:** 393–413.

## ON THE DIURNAL VARIATION OF TEMPERATURE IN THE ANTARCTIC.

By J. ROUCH.

[Abstracted from *Comptes Rendus*, Paris Acad., Nov. 2, 1920, pp. 868–869.]

After studying the inversions of temperature [1] observed at the station Pourquoi-Pas? on the Petermann Island (lat. 65° 10′ S., long. 66° 34′ W., Paris), in the Antarctic, the author has found an interesting peculiarity in the diurnal march of temperature on clear days, *i. e.*, days having cloudiness less than 5. In addition to the ordinary maximum occurring about noon, there is another maximum about midnight. This phenomenon is marked in winter and autumn, but does not appear in summer and spring. In the autumn, the principal maximum occurs about 13 h., and the secondary maximum about 2 h. Minima occur at about 7 h. and 22 h. In winter the principal maximum occurs at 1 h. and the secondary at 13 h. It is interesting to note that, in winter, the night temperature is higher than the day, sometimes as much as 4° C.

The diurnal variation of temperature seems to be unrelated to any of the other meteorological elements, with the exception of cloudiness. The effect of the sun, during the winter, is naturally very slight, and it is at these times that the maximum occurs at a time corresponding to night hours. This seems to be a general characteristic of temperature in the Antarctic since it has been confirmed by other observers.—*C. L. M.*

## SMOKE-TRAVEL FROM GREAT FOREST FIRES IN RUSSIA.

[Abstract of note by Charles Rabot, *La Nature Suppl.*, Oct. 16, 1920, p. 121.]

A tremendous forest fire which has been raging in north Russia, northeast of Petrograd, has emitted great quantities of smoke. With an easterly wind, on August 29–30 a great cloud of smoke entered Sweden and the next day eastern Norway. On September 1 it reached the heads of the Norwegian fiords, and extended north to Falun in Sweden and Trondjem in Norway. On the 1st and 2d the smoke became so thick in the mountains of southern Norway that the people sought for a local forest fire. At Kristiania, 1,500 kilometers from the fires, the smoke was so dense and acrid that people closed their windows, so as not to be bothered by it.

Other cases of great smoke clouds [2] are cited, namely, one in 1857, when the smoke from a burning peat bog in Oldenburg (northwest Germany) covered all central Europe with a thick cloud, and another in 1913 (Afterpost, Kristiania), when smoke from a great forest fire in Canada reached Iceland and even Norway.—*C. F. B.*

## METEOROLOGICAL SERVICE IN PALESTINE.

Mr. Perez W. Etkes, a member of the Signal Corps Meteorological Service during the war, has recently written a letter to the editor of the MONTHLY WEATHER REVIEW from Jaffa, Palestine, where he is now situated. In addition to his work as an engineer in the Palestine Water Commission, Mr. Etkes has been active in the establishment of a network of meteorological stations. This network has been put in operation under the direction of the Physical Department, at Cairo, and while the equipment is not complete at all stations, the effort is being made to get a well-organized and efficient meteorological service under way at the earliest possible time.—*C. L. M.*

[1] *Comptes Rendus*, 1920, t. 171, p. 498. Abstract in MO. WEA. REV., September, 1920, **48:** p. 534.
[2] Cf. H. Lyman, Smoke from Minnesota forest fires. MO. WEATHER REV., November, 1918, **46:** 506–510.